

NEUTRON PICK-UP ($n, {}^2n^*$) REACTION

M. Zadro and Đ. Miljanić
Ruder Bošković Institute, Zagreb

In recent years many different nuclear reactions with unbound ejectiles were discovered and used for nuclear structure studies. Among them the most prominent ones are the (a,d) and (b, ${}^2\text{He}$) reactions (see e.g. [1]). d and ${}^2\text{He}$ stand for singlet n-p and p-p final state interaction (FSI), respectively, and a and b are different projectiles. However, there were neither experimental nor theoretical studies on the ($n, {}^2n^*$) reactions, ${}^2n^*$ being singlet n-n FSI. Because of that an effort is made to estimate ${}^2n^*$ contributions in the ($n, 2n$) reaction cross sections. Standard zero-range DWBA together with the experimentally obtained spectroscopic factors and l assignments (e.g. from the study of (p,d) reactions) are used in these neutron pick-up ($n, {}^2n^*$) reaction cross section calculations. These calculations show, that the ${}^2n^*$ contributions could be large enough to be easily experimentally discriminated against other 2n contributions.

References:

- [1] J. van Driel, R. Kamermans and R.J. De Meijer, Nucl. Phys. A350 (1980) 109 and references therein.